

Magnekon Polytermacon/Al®

Magnet Wire



A Viakable Company

Description

The POLYTERMACON/Al® magnet wire is manufactured using a base coat of polyesterimide resin and a top coat of polyamideimide (AI). This wire combines the excellent dielectric and thermal characteristics of the polyesterimide resins and the benefits offered by the chemical structure of the polyamideimide.

Polyesterimide offers protection against overloads and crossovers, in addition to its excellent resistance to chemical agents. This makes the POLYTERMACON/Al® the optimum selection for motor coils used in the machinery and tool industries, in automotive applications, distribution transformers and in hermetic refrigeration motors⁽¹⁾.

The Polyamideimide coat offers a smooth and sturdy surface with a low coefficient of friction, which makes the POLYTERMACON/Al® highly resistant to the damage caused by high-speed winding machines.

This product is manufactured in three insulation builds - single (Code PTS/Al), heavy (Code PTD/Al) and triple (Code PTT/Al) and is offered in either copper or aluminum conductors.

POLYTERMACON/Al® magnet wire with a copper conductor is recommended for use in electrical equipment with a thermal class of up to 200 and if so specified, up to 220 °C.

UL Designation	Thermal Class	NEMA MW-1000
PAI 200	200 °C Cu	MW 35-C MW 36-C MW 73-C ⁽¹⁾
PAI 220	220 °C Al	MW 35-A ⁽²⁾ MW 36-A ⁽²⁾ MW 37-C ⁽²⁾ MW 38-C ⁽²⁾

Specifications

Meets the requirements set forth in the following standards:

- NMJ-J-482.
- NEMA MW 1000, MW 35, MW 36, MW 37⁽²⁾, MW 38⁽²⁾ and MW 73⁽¹⁾.
- IEC 60317-13, 25 and 29.
- UL recognition under file E102627.

Characteristics

- Resistant to high temperatures.
- High resistance to electrical overloads.
- Great winding ease.
- Resistant to R-12, R-22 and R-134 refrigerants used in refrigeration compressors⁽¹⁾.
- High resistance to abrasion.
- Very high degree of dielectric strength, even in humid conditions.
- Highly resistant to heat shock.
- Great resistance to thermoplastic flow.
- Resistant to solvents.

Range of Gauges

Copper Conductors		
Insulation Build	AWG	mm
Single (Code PTS/Al)	4 - 42	5.189 - 0.064
Heavy (Code PTD/Al)	4 - 42	5.189 - 0.064
Triple (Code PTT/Al)	14 - 40	1.628 - 0.080

Square and rectangular wires with Heavy insulation are also offered in combinations of sizes ranging from 40 to 230 mil (1 to 5.842 mm) in thickness and from 100 to 500 mil (2.540 to 12.700 mm) in width. Ask about specific sizes.

Aluminum Conductors		
Insulation Build	AWG	mm
Single (Code PTS/Al A)	14 - 24	1.628 - 0.511
Heavy (Code PTD/Al A)	21 - 28	1.628 - 0.321

Square and rectangular wires with Heavy insulation are also offered in combinations of sizes ranging from 100 to 200 mil (2.540 to 5.080 mm) in thickness and 150 to 500 mil (12.700 to 3.810 mm) in width. Ask about specific sizes.

Principal Applications

AUTOMOTIVE

- Alternators.
- Field coils.
- Starter motors.
- All types of small motors (windshield wipers, power windows, etc.)

ELECTRONICS

- Coils for color TV yokes.

SPECIAL TRANSFORMERS

- Ballasts and power supplies.



POWER TRANSFORMERS

- In Oil.

DISTRIBUTION TRANSFORMERS

- Dry, 180 °C Class.
- In Oil.

LOW POWER AND FRACTIONAL MOTORS

- Open.
- Hermetic (refrigeration)⁽¹⁾.
- Starter coils.

MOTORS IN GENERAL

Technical Data

Polytermacon/AI® TYPICAL TEST VALUES FOR A POLYTERMACON/AI® HEAVY, 18 AWG WIRE.
Typical values only, not intended to be used as a specification.

Test	Specification (ANSI / NEMA MW 1000) MW 35 and MW 37	Test Method	Typical Results
Electrical			
Dielectric Strength	≥ 5700 V	NEMA	12800 V
Continuity	≤ 5 discontinuities per 100 feet @ 1500 V	NEMA	0 (Zero)
Mechanical			
Elongation	Minimum of 32%	NEMA	38%
Adherence and Flexibility	20% sudden jerk, rolled 10 turns around a mandrel 3 times the diameter of the wire, visual inspection, no cracks or exposed conductor.	NEMA	No cracks
Springback	≤ 58 °	NEMA	54 °
Unidirectional Abrasion	Average of 3 measurements @ 0 °, 120 ° and 240 °; ≥ 1150 grams.	NEMA	1492 grams
Chemical			
Resistance to Transformer Oil	≥ 5700 V	NEMA ^(a)	Passes
Solderability	Immersion for 30 minutes @ 60 °C in Xylol and Xylol/Butil Cellsolve 50/50; dry samples for 10 minutes @ 150 °C.	NEMA	Passes
Resistance to Solvents	Immersion for 24 hours, after heating to 125 °C.	Not soften sufficiently to expose the bare conductor.	
	Naphta		Passes
	Toluene		Passes
	Ethylic Alcohol		Passes
	5% Sulfuric Acid		Passes
	Perchloroethylene		Passes
Xylene	Passes		
R-22 Refrigerant Extraction ⁽¹⁾	≤ 0.25%	NEMA	0.20%
Thermal			
Thermal Stability	20,000 hours @ 200 °C	ASTM	210 °C
	20,000 hours @ 220 °C ⁽²⁾	ASTM	225 °C
Heat Shock	20% sudden jerk, rolled 10 turns around a mandrel 3 times the diameter of the wire, before heating for ½ hour @ 220 °C and 240 °C ⁽²⁾	NEMA	Passes
Thermoplastic Flow	≥ 300 or 325(2) °C	NEMA	390 °C

⁽¹⁾ Under hermetic requirement.

⁽²⁾ Under 220 °C requirement.

^(a) Taken from MW 15.